

Class : I PG
Major : Computer Science

Time: 3 hours
Max. Marks: 60

17MCSC05 : ADVANCED DATA STRUCTURES AND ANALYSIS OF ALGORITHMS

PART A

(10 * ½ = 5 Marks)

Circle the correct answer

1. In analysis of algorithm, approximate relationship between the size of the job and the amount of work required to do is expressed by using _____
a) Central tendency b) Differential equation c) Order of execution d) Order of magnitude
2. The Φ notation is _____
a) Symmetric b) Transitive c) Reflexive d) All the above
3. _____ is ordered collection of homogenous data element which follows FIFO procedure
a) STACK b) QUEUE
c) SPARSE d) MATRIX
4. _____ operation is used to visit all elements in an array
a) Memory b) Traversing c) Searching d) Sorting
5. Prim's algorithm is based on _____ method
a) Divide and conquer method b) Greedy method c) Dynamic programming d) Branch and bound
6. Which of the following searching methods requires that all keys must reside in internal memory?
a) Binary search b) Sequential search c) Hashing d) Depth first search
7. The Sorting method which is used for external sort is _____
a) Bubble sort b) Quick sort c) Radix sort d) Selection sort
8. _____ is the process of re-arranging a given set of objects in a specific order
a) Searching b) Sorting c) Merging d) Hashing
9. Advantage of finding maximum and minimum using divide and conquer method instead of using conditional operators is _____
a) Reduce Space complexity b) Reduce Time complexity
c) Get accurate value d) Simple calculations
10. _____ is set of all decision problems solvable by deterministic algorithms in polynomial time
a) NP b) P c) NP-P d) None

PART – B

(5 * 4 = 20 Marks)

Answer ALL Questions

Each answer should not exceed 200 words or one page

11. (a) What are the two kinds of algorithm efficiency? Explain
(OR)
11. (b) Write note on Big-O, Theta and Omega formal notations
12. (a) Explain the operation performed on Stack.
(OR)
13. (a) Explain ^{any} one of graph representation method.
13. (b) Write and explain the kruskal's algorithm for computing the minimum spanning tree.
(OR)
14. (a) Explain the steps of insertion sort algorithm with example.
(OR)
14. (b) Explain ISAM and VSAM access methods.
15. (a) Write the basic concept of divide-and-conquer algorithm. Explain with an example.
(OR)
15. (b) Write the difference between the Greedy method and Dynamic programming.

PART - C

(5 * 7 = 35 Marks)

Answer ALL Questions

Each answer should not exceed 600 words or three pages

16. (a) Write the basic steps of development of an algorithm
(OR)
16. (b) Explain the general plan for analyzing efficiency of control structures
17. (a) Explain the various types of traversal technique with algorithm
(OR)
17. (b) Explain the basis of AVL tree and B+ Tree with diagram
18. (a) Discuss the minimum cost spanning tree algorithm with example
(OR)
18. (b) Explain the Depth First search and Breadth First search algorithm and analyze the same
19. (a) Explain the algorithm of quick sort with examples and analyse its time complexity
(OR)
19. (b) What is external sorting? Explain the algorithm for Multi-way Merge and Polyphase Merge briefly
20. (a) Write and explain the basic concept of parallel algorithms
(OR)
20. (b) Discuss the basic concept of NP-Hard and NP-Complete problems with example